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The Canadian iron ore industry

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Produced by
External Information Programs Division,
Department of External Affairs,
Ottawa, Ontario, Canada
K1A 0G2

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The undisputed importance of steel in an industrial society is matched by that of iron ore, the metal's principal source. Canada's significance in the iron ore industry may be judged by the record volume of its producer shipments for domestic and export markets of 59 million tonnes (metric tons), valued at \$1 807 million for 1979, when it was the world's sixth largest producer. In 1980, Canada was the third largest exporter of the ore with 39 million tonnes, valued at \$1 240 million. Domestic production provides some 65 per cent of iron ore needed in the Canadian iron and steel industry, which is the tenth largest in the world.

The growth of Canada's iron ore industry was initially very slow, with only 6.5 million tonnes produced from 1886 to 1924 and none for the next 14 years. Until 1949, most of Canada's iron ore production came from mines in Ontario. With the addition of the Newfoundland mines and more especially the development of mines in the Quebec-Labrador region by 1954, the Canadian industry began a period of rapid expansion that accelerated during the 1960s and early 1970s. By 1980 there were 11 companies with 12 mining operations producing iron ore and byproduct iron ore. Five operations were in Ontario, two in British Columbia, two in Quebec, two in Newfoundland (Labrador) and one on the Quebec-Labrador boundary.

Newfoundland was the leading province in 1980 production with 26.2 million tonnes, followed by Quebec with 17.4 million, Ontario with 6.5 million and British Columbia with about 700 000.

In recent years imports of iron ore have increased dramatically from 2 million to about 6 million tonnes. Depleted ore reserves in Ontario have contributed to this import trend. Production from Ontario mines declined from 11 million tonnes in the early 1970s to 6.5 million tonnes in 1980 and several mines in Ontario and British Columbia have closed. The rise in imports is also owing to the fact that central Canadian steel companies are committed to take a prorated portion of production from recent expansions of United States' mines in which they acquired equity.

In Canada, the iron ore industry has changed in several ways over the years. First, the focus of production has shifted to the East, as production capacity increased in the Quebec-Labrador region. Second, the size of individual operations has increased considerably from units of 1 million tonnes capacity to huge complexes capable of producing 20 million tonnes of product annually. Third, the products shipped by iron ore companies have changed from direct-shipping ore to concentrates and direct-shipping ore, and more recently to predominantly pellets

and concentrates. Canadian production is currently divided among these products in the proportion of 50 per cent pellets, 40 per cent concentrates, less than 7 per cent direct-shipping ore and about 3 per cent sinter.

International trade

The Canadian iron ore industry depends greatly upon international trade and in recent years Canadian producers have exported approximately 80 per cent of their iron ore products. The largest market for Canadian iron ore is the U.S. but substantial quantities go to the European Community and a small amount is exported to Japan and other countries.

International trade in iron ore has increased significantly because iron ore resources located close to major steel-making centres have declined in reserves and quality. Increasing amounts of iron ore have been derived in recent years from major new projects located in countries such as Canada, Australia and Brazil. The principal export markets for iron ore, aside from trade between Communist countries, are Japan, the U.S. and the European Community where crude steel production in 1980 was approximately 111 million tonnes, 101 million tonnes and 128 million tonnes respectively. A growing market for iron ore trade is the Pacific-

Asia region which produced about 33 million tonnes of crude steel during the same year.

Canada is the world's third largest exporter of iron ore products. In 1979, Canadian exports amounted to some 48 million tonnes, a record. In 1980, a year when steel production world-wide declined, Canada exported approximately 39 million tonnes of iron ore. Australia remained the largest supplier of iron ore, exporting 83 million tonnes in 1980 and Brazil was second with iron ore exports totalling almost 81 million tonnes. Other important suppliers for international trade include the U.S.S.R., India, Liberia, Venezuela and the Scandinavian countries.

A distinction can be made among world markets on the basis of geographical location and the type of iron ore product consumed. North America has become increasingly more dependent upon pellets as a raw material for its steel mills and today the ore is predominantly in the form of pellets. This trend has developed because ore supply in the U.S. has shifted from direct-shipping ores to the taconite ores of Minnesota and Michigan. These ores, which are extremely fine grained and low grade, must be concentrated and "pelletized" to be used in a blast furnace. European and Japanese steel mills use a blast furnace burden consisting largely of lump

ore and sinter, the latter being produced at the steel mill site from ore fines and concentrates. Substitution between iron ore products is technically feasible but steel mills have generally not been inclined to change from proven and long established blast furnace practices. Accordingly, the peculiar consumption characteristics of existing steel complexes will probably continue.

The transportation charge is a major element in the delivered cost of iron ore, amounting to 30 per cent in some cases. While in the recent past a considerable amount of trans-oceanic trade took place, rising fuel costs and bulk carrier rates are discouraging the practice and less iron ore is expected to move across oceans in the future. Currently, the European market is accessible in relation to transportation cost from North American, African and South American countries. Australia has a transportation cost advantage to the Japanese market and Canada has a transportation cost advantage to the North American market.

Delivered cost also takes account of ore quality and production costs. In this respect Brazilian ore is usually the price trend-setter in the European market because of its high quality and low production cost, even though the distance to market is farther than from several other suppliers. Similarly, Australian ore is

the benchmark for prices in the Japanese market, mainly because of its proximity to that market compared to other suppliers, and also because of the high quality characteristics of Australian ores. Both Australia and Brazil have grown very rapidly as iron ore suppliers during the past decade. Together these two countries account for about 45 per cent of total world exports of iron ore.

Future developments

The growth of the Canadian iron ore industry is dependent on domestic steel mill requirements and the growth in iron ore exports. Therefore, to properly forecast the future importance of Canadian iron ores in both domestic and world markets, an assessment must be made of the supply and demand patterns of the major steel-producing countries.

Canada's raw-steel production in 1980 was 15.9 million tonnes, only 1.2 per cent less than the record production of 16.1 million tonnes in 1979. Record output was achieved during the first half of 1981 as orders remained strong but a major four-month strike in the industry reduced production later in the year. Furthermore, demand decreased in the second half of the year owing to high interest rates in North America and the continuing recession throughout the world. Total production for 1981 was 14.6 million tonnes.

Canadian steel mill exports of rolled steel products increased greatly in 1980. A slight increase to 1.4 million tonnes was realized in the U.S. market; exports to other countries, however, increased from 0.3 million tonnes in 1979 to 1.3 million tonnes in 1980. This exceptional performance is largely a direct result of the devalued Canadian dollar. At the same time, imports of primary steel products declined from 2.2 million tonnes in 1979 to 1.5 million tonnes in 1980. As the Canadian dollar is expected to appreciate in value relative to other currencies over the next several years, imports and exports in primary steel products are projected to return to a near balance at an annual rate of approximately 3 million tonnes.

In the longer term, Canadian steel production is forecast to expand at a 2 per cent annual growth rate, based upon the steel trade situation described above and domestic demand projections. The industry currently consumes about 17 million tonnes of iron ore products of which 6 million tonnes are imported, largely from the U.S. Assuming that the ratio of iron ore to scrap for steel-making does not change significantly, domestic steel mills will require about 21 million tonnes of iron ore products by 1990. It is further assumed that imports of iron ore will continue at approximately 6 million tonnes a

year, and accordingly, the annual demand for domestic ore is expected to increase from a current consumption of 11 million tonnes to about 15 million by 1990.

Owing to the current depressed level of production in most foreign steel-producing countries, Canadian exports of iron ore are not expected to show great improvement until 1982-83. Exports in 1980 fell to 39 million tonnes from a record 48.8 million tonnes in 1979. If a predicted world-wide recovery in steel production occurs in 1982-83, Canadian iron ore exports could rebound temporarily to the 1979 level. The international iron ore market should start to strengthen again by 1985-86 because world capacity growth for production is not expected to keep pace with the medium term (five to ten years) incremental growth in demand. Under this market situation, annual Canadian exports of iron ore could stabilize at about 45 million tonnes.

While there is ample capacity at existing Canadian mines to supply the domestic and export markets for most of the 1980s, expansions or the development of a new iron ore mine could be warranted by the end of the decade. However, the timing and location of a Canadian iron ore development is highly conjectural because of a number of evolving trends in the industry.

In the U.S. market, steel production is expected to increase at an annual rate of only 0.6 per cent during the next decade.¹ Recent expansions in the Minnesota and Michigan iron ore fields could easily supply incremental growth of consumption in the Great Lakes region, the centre of U.S. steel production. It is doubtful therefore, whether Canadian iron ore producers will be able to obtain a portion of this incremental market. Indeed, Quebec-Labrador producers may have difficulty maintaining their existing level of shipments to the Great Lakes market.

Ore supply for the U.S. Atlantic and Gulf coasts is mainly derived from Quebec-Labrador and South America. Ontario and U.S. Upper Lakes ore is not competitive in this market area, partly because of Seaway shipping costs. Quebec-Labrador producers have increased deliveries to the region in recent years and shipments will probably continue to increase over the next decade. However, the demand for iron ore in this market region will be modest because of the growing use of electric furnaces and will not by itself warrant the expansion of ore capacity in Quebec-Labrador.

¹ Growth rates for foreign steel industries and ore import needs are based on data contained in the paper "Iron Ore Availability: The Need For New Development" by W.W. Bilhorn and R.E. Sargent of AMAX Inc., presented at Metal Bulletin's Iron Ore Symposium, Frankfurt, West Germany, March 1981.

The European steel industry is expected to grow at a rate of about 2.5 per cent over the next decade and Brazil, South and West Africa, and Canada are the probable suppliers of ore for this market. Quebec-Labrador producers could expand their output of sinter feed and concentrates, and they have a transportation cost advantage over Brazil and South Africa, even though production costs are higher. With escalating transportation charges as fuel prices rise, enormous capital costs required to establish new iron ore developments and expensive financing charges for capital, the established Quebec-Labrador producers may increase their competitiveness in European markets.

A rapid growth in steel production is expected in Middle East countries where imports are projected to rise from 2.4 million tonnes in 1980 to about 15 million by 1990. While iron ore could be obtained from several sources, it may be possible for Quebec-Labrador producers to secure part of this market, particularly if the real price of iron ore rises in the second half of the decade as expected.

Steel production is forecast to grow strongly in Japan, other Pacific areas and far eastern countries. However, Canadian ore will not be competitive in this region, mainly because of high production costs and rising transportation charges.

Australia and India will be the major suppliers, with Brazil and African countries providing most of the remainder.

In summary, the main areas of potential market growth for Canadian iron ore producers are the domestic steel industry, Western Europe, Middle East countries and the eastern U.S. coast. This could be reduced by a decline in shipments to Japan. Installed capacity in the Quebec-Labrador region is sufficient to satisfy this market demand until 1990, when total requirements are expected to reach 60 million tonnes of iron ore products. Quebec and Labrador producers could expand to meet incremental growth requirements of the domestic steel industry and international trade in the 1990s. Alternatively, domestic needs could be met by developing a new iron ore project in Ontario or increasing imports from U.S. producers, either of which would probably delay expansions in the Quebec-Labrador region for several years.

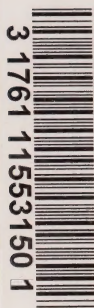
While the foregoing seems to be a reasonable outlook for Ontario and Quebec-Labrador producers, it does not preclude the development of iron ore deposits in other areas of Canada. In particular, the Canadian Arctic has several high quality iron

ore occurrences that may be of considerable interest to European steel mills. The logistics of moving iron ore through Arctic waters is a major deterrent to their development, but it would not be inconceivable to have one of these deposits in production in the 1990s.



External Affairs
Canada

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ISSN 0228-3808